B. INPUT POSITION (UTM/UPS COORDINATE DATA PROVIDED BY BATTALION SURVEY, SUCH AS AN SCP THAT THE GLPS IS SET-UP ON TOP. THIS DATA IS INPUT MANUALLY USING THE GLPS KEYPAD)

C. BACK POLARPLOT (UTM/UPS COORDINATES OF A POSITION THAT THE GLPS SIGHTS IN ON FROM 30-2500 METERS AWAY AND USING THE GLPS SOFTWARE AND LASER RANGEFINDER FEATURES BRINGS LOCATION DATA TO THE GLPS UNKNOWN POSITION) THIS POSITION DATA CAN BE DELIVERED TO THE GLPS THREE DIFFERENT WAYS. IT CAN BE MANAULLY INPUTTED, INPUTTED DIGITALLY FROM THE PLGR AS A WAYPOINT OR FROM THE GLPS AS A STORED REFERENCE POINT FROM THE EDIT REFERENCE POINT OPTION.
NOTE: POSITION DATA PROVIDED BY BATTALION AND USED IN THE INPUT POSITION AND BACK POLARPLOT OPTION WILL PLACE THE BATTALION FIRING ASSETS ON COMMON GRID, USE OF PLGR LOCATION FOR POSTIONING DOESN'T MEET THE DEFINITION OF COMMON GRID IN AS FAR AS THE SEPARATE FIRING ELEMENTS HAVING THE SAME LOCATION ERROR.

5. ORIENTING THE GLPS FOR DIRECTION (ONCE POSITIONING DATA IS PROVIDED TO THE SYSTEM, THERE ARE TWO METHODS USED TO ORIENT THE SYSTEM ON GRID NORTH. THE MOST ACCURATE MEANS IS BY RUNNING THE SURVEY NORTH SEEKING GYROSCOPE, AND THE SECOND MEANS IS TO USE EXISTING DIRECTIONAL CONTROL ALREADY ESTABLISHED ON THE GROUND. THIS METHOD SAVES THE 210 SECOND GYRO SPIN TIME.

6. PREPARING THE POSITION TO RECEIVE THE FIRING ELEMENT (AFTER THE GLPS ORIENTATION IS COMPLETED THE OPERATOR SELECTS THE LAY BY DEFLECTION OPTION AND ESTABLISHES EACH HOWITZER LOCATION. FIRST THE AOF IS INPUTTED, AND THEN THE OPERATOR SIGHTS ON EACH POSITION AND DETERMINES INITIAL DEFLECTIONS, RANGE AND VERTICAL ANGLES TO EACH GUN LOCATION. NEXT THE GLPS CALULATES UTM/UPS GRID COORDINATES TO EACH GUN AND STORES THEM. THIS INFO IS THEN PASSED TO THE FDC AND GUN GUIDES TO ASSIST DURING THE OCCUPATION AND ENHANCE THE UNITS READY TO FIRE TIME.

7. POSITION IMPROVEMENT ASSETS AVAILABLE TO THE GUNNERY SERGENAT WHILE WAITING FOR THE MAIN BODY TO ARRIVE:

A. ESTABLISH AN ORIENTING STATION (OS) WITH GRID AND ALTITUDE, AN AZIMUTH OF THE ORIENTING LINE (OL) AND A DESCRIPITION OF AND DISTANCE TO THE END OF ORIENTING LINE (EOL) USING THE LAY BY AZIMUTH OPTION.

B. INITIATES THE PERIMETER DEFENSIVE DIAGRAM USING THE GLPS CAPIBILITIES TO DETERMINE GRID COORDINATES TO LP's, OP's, CREW SERVED WEAPONS POSITIONS, ETC.

C. CAPABILITY TO MOVE BOTH LOCATION AND DIRECTIONAL CONTROL ON THE GROUND (i.e. GRAPHIC TRAVERSE) TO ESTABLISH AND ALTERNATE POSITION.

8. LAY OF THE BATTERY OR PLATOON DURING THE OCCUPATION (USING THE LAY BY DEFLECTION OPTION TO LAY THE FIRING ELEMENT TO THE SAME ZERO MIL TOLERANCE AS WITH THE M2A2 AIMING CIRCLE, STORING THE FINAL LAY DATA IN THE GLPS AND PASSING THIS TO THE FDC FOR UPDATING THE FDC LCU OR BCS.

VERIFYING THE LAY OF THE PLATOON

After laying of the platoon has taken place the platoon leader will verify the lay by use of M2 aiming circle referred to as the Safety Circle. To safe the platoon, the Platoon Leader or designated Safety Officer, will perform the following steps:

1. Set up and orient an M2 aiming circle using a method other than that used by the lay circle. This aiming circle must be located where all howitzers can see it and should not be any closer than 10 meters to the lay circle. Care must also be taken not to position the safety circle along the line of sight between a howitzer and the GLPS.

2. After the safety circle is established, command the instrument operator on the GLPS to measure a deflection to the safety circle. The instrument operator on the GLPS determines a deflection to the safety circle, and then he should announce that deflection to the safety circle operator. This procedure serves to verify that the GLPS was oriented properly when it laid the platoon. The tolerance allowed between the deflections of the lay circle and the safety circle can be found in the Local Range Regulations for the firing range you are using.

3. If the lay circle and the safety circle deflections are within tolerance, as specified by Local Range Regulations, the instrument operator on the safety circle will place the deflection ready by the lay circle on the Upper Motion of the safety circle. With the Lower Motion, the instrument operator will sight back in on the lay circle. This serves to align the 0-3200 line of the safety circle parallel to the 0-3200 line GLPS.

NOTE: When an aiming circle is used to orient another aiming circle for direction, the readings between the two circles will be 3200 mils apart because both circles measure horizontal clockwise angle from the line fire. IF THE LAY CIRCLE IS A GLPS IS DOESN'T HAVE A RED SCALE. If the safety circle operator after sighting on the GLPS remembers that, "if you see red, read red" or if the deflection given is greater than 3200 the safety circle operator will have to subtract 3200 the deflection given by the GLPS. Safety Circle Command: "Lay Circle Refer Aiming Point the Instrument". Lay circle will reply with, "Aiming Point Identified, Deflection XXXX". If the deflection on the safety circle and the aiming circle are within Local Range Regulations, set announced deflection on the safety circle and using lower motion sight in on the lay circle.

4. The instrument operator on the safety circle will command: "Platoon Refer, Aiming Point This Instrument". All gunners will refer a deflection to the safety circle. If the deflection referred by a howitzer is within that tolerance given in the Local Range Regulations, then the operator on the safety circle will announce that the howitzer is safe. Once all howitzers are safe the operator will announce: "The Platoon is Safe".

ZEROING THE LAY CIRCLE AND THE SAFETY CIRCLE

SEQUENCE	MEMORY AID	STEPS
Do this FIRST	U	(a) Place announced DF on the Upper Motion.
Do this SECOND	L	(b) Sight on the lay circle with the Lower Motion.
Do this THIRD	U	(c) Sight of the pantel on weapon with the Upper Motion.

COMMANDS FOR LAYING THE BTRY/PLT

1. (GSG) "BTRY/PLT ADJUST AIMING POINT THIS INSTRUMENT."

2. (GUNNER) "NUMBER (SO AND S0) AIMING POINT IDENTIFIED."

3. (GSG) "NUMBER (SO AND SO) DF_____."

4. (GUNNER) "NUMBER (SO AND SO) DF_____,_____MILS."

5. (GUNNER) "NUMBER SO AND SO), READY FOR RECHECK. When difference is less than 10 mils, continue steps 3-5 until weapon Is zero mils.

6. (GSG) "NUMBER (SO AND SO) IS LAID."

7. (GSG) ONCE ENTIRE BTRY/PLT IS LAID ANNOUNCE, "BTRY/PLT IS LAID."

MEASURING

THIS PROCEDURE IS PERFORMEND WITH THE GLPS AND THE HOWITZER PANTEL.
1. MEASURING THE AOF, LOF OR MEASURED AZIMUTN OF HOWITZER TUBE, YOU WILL NEED A REFERRED DEFLECTION FROM THE HOWITZER.

SEQUENCE	STEPS
Do this FIRST	(a) Select the Lay by Azimuth option on the GLPS and measure an azimuth to the howitzer pantel.
Do this SECOND	(b) Command howitzer to refer
Do this THIRD	(c) Subtract the referred deflection from measured azimuth(+6400 If necessary) the remainder is the measured azimuth.
Do this NEXT	(d) MATH STEP: MA(from GLPS)-RD(from gun)=MA/AOF/LOF
Do this LAST	(e) Report the measured orienting angle to the FDC.

KEY POINTS

1) PROPER SIGHT PICTURE WHEN LASING TO DETERMINE GRID LOCATION DATA
2) USE PROPER PROCEDURES AND GLPS WARNING PROMPTS "BATTERY IS LOW" & "BATTERY IS EMPTY" TO MAINTAIN MAXIMUM BATTERY STORAGE CAPABILITIES (MEMORY)
3) THE SAFETY PRACTICES OF DUAL INDEPENDENT CHECKS DO NOT STOP WITH THE USE OF THE GLPS. THE USE OF A SAFETY CIRCLE, VERIFING LOCATION AND DIRECTIONAL CONTROL DERIVED FROM THE GLPS/PLGR COMBINATION IS A MUST. THESE ALONG WITH ALL OTHER ESTABLISHED UNITS SAFETY PROCEDURES ENSURE FIRES ARE TIMELY, ACCURATE AND SAFE.
4) USE OF THE GLPS TO ESTABLISH A DECLINATION STATION FOR THE M2A2 AIMING CIRCLE AND THE M2 COMPASS

GUN LAYING & POSITIONING SYSTEM (GLPS)

GRAPHIC TRAINING AID GD JPA Aug 00

PLGR SET-UP FOR GLPS OPERATION:

1. FROM MAIN MENU SELECT: SET-UP
2. FROM SET-UP MODE SELECT: AVERAGING
   SV-TYPE: all-y
3. FROM SET-UP UNITS SELECT: UTM/UPS METRIC
   ELev: meter MSL or DTM (#1)
   ANG:Mil-u Grid
4. FROM SET-UP MAGVAR SCREEN: TYPE:Calc mil-u
   WMM 1995
5. FROM SET-UP SCREEN: ELHold: automatic
   TIME: ZULU (with locate setting)
   ERR: FOM
6. FROM SET-UP DTM SCREEN: Selected Datum must match Operation or Map datum being used by the unit, and the Timer setting should allow enough time for the averaging process to update the position with the appropriate # of hits (200)

NOTE #1 Select MSL for elevation values referred to Mean Sea Level, select DTM for elevation referred to map datum; this is determined by Battalion Ops.

ATTENTION: When live firing with PLGR location data input in the GLPS, the PLGR FOM reading must be a **FOM 1** when used for artillery positioning.

GLPS BATTLE DRILL

1. SELECT GLPS LOCATION DURING ADVANCE PARTY SECURITY SWEEP (USE SAME TACTICAL CONSIDERATIONS FOR LOCATION AS WITH THE M2A2 AIMING CIRCLE) HOWEVER IF THE GLPS IS LASING TO DETERMINE GRID LOCATION DATA THE MINUMUM DISTANCE OF THE LASER RANGEFINDER IS 30 METERS, AND IF THE PLGR IS USED FOR PROVIDING LOACATION DATA TO THE GLPS ATTENTION MUST BE GIVEN TO THE ELECTRONIC LINE OF SIGHT OF THE PLGR SO THAT THE SIGNAL FROM THE SATELLITE IS NOT MASKED.

2. POSITION PLGR ON SELECTED GLPS LOCATION, THIS ALLOWS PLGR SUFFICENT TIME TO UPDATE POSITION DATA AND BE AVAILABLE FOR USE BY OPERATOR WHEN NEEDED.

3. SET-UP AND LEVEL SYSTEM IN ACCORDANCE TO PROCEDURES OUTLINED IN TM 9-6675-347-13&P.

4. DETERMINE WHAT POSITION DATA IS AVAILABLE FOR THE GLPS. THE GLPS NEEDS POSITION DATA, WHICH IN TURN ALLOWS THE NORTH SEEKING GYRO THE ABILITY TO ACCURATELY ORIENT ITSELF ON GRID NORTH. THERE ARE THREE SEPARATE MEANS OF PROVIDING POSITION DATA TO THE SYSTEM:
   A. GPS POSITION (GPS UTM/UPS COORDINATE DATA PROVIDED BY THE PLGR FOLLOWING THE STEPS LISTED ABOVE IN PLGR SET-UP)